

CLAIMS:

1. A method comprising following steps in sequence for producing both superior bending fatigue strength and pitting fatigue life of gear(s) and/or shaft components made of steel:

- 5           (a) Modified Carbonitriding treatment  
          (b) Hard Shot Peening process.

2. The said method as claimed in Claim 1 where in said steel material comprising 0.10 to 0.30 weight % Carbon, 0.15 to 0.35  
10 weight % Silicon, 0.8 to 1.5 weight % Chromium, 0.6 to 1.5 weight % Manganese, 0.017 to 0.040 weight % Aluminium, and balance iron including impurities, produced in vacuum degassing and alike routes.

15           3. The said method as claimed in Claim 1 where in said steel material comprising 0.10 to 0.30 weight % Carbon, 0.15 to 0.35 weight % Silicon, 0.3 to 1.5 weight % Chromium, 0.30 to 2.0 weight % Nickel, 0.08 to 0.50 weight % Molybdenum, 0.6 to 1.5 weight %  
20 Manganese, 0.017 to 0.040 weight % Aluminium and balance iron including impurities, produced in vacuum degassing and alike routes.

4. The said steel material as claimed in Claim 2 treated by

the said Modified Carbonitriding treatment as claimed in 1(a) comprising the following steps in sequence,

Carburising at 900 to 1050 degree Centigrade,

Cool down to 840 to 870 degree Centigrade for Carbonitriding

5 with 15 to 20 % Ammonia,

Quench in a medium at 120 to 150 degree Centigrade

Tempering at 160 to 180 degree Centigrade.

5. The said steel material as claimed in Claim 2 processed  
10 by the said Hard Shot Peening process as claimed in (b) having the following process parameters:

shot size ranging from 0.5 to 0.8 mm,

shot hardness 610 to 800 Hv,

shot velocity 60 to 150 m/sec ,

15 part coverage 200 to 500% and

Almen A arc height 0.6 to 0.9 mm.

6. The said steel material as claimed in Claim 3 treated by the said Modified Carbonitriding treatment as claimed in 1(a)  
20 comprising the following steps in sequence,

Carburising at 900 to 1050 degree Centigrade,

Cool down to 840 to 870 degree Centigrade for Carbonitriding

with 15 to 20 % Ammonia,

Quench in a medium at 120 to 150 degree Centigrade  
Tempering at 160 to 180 degree Centigrade.

7. The said steel material as claimed in Claim 3 processed  
5 by the said Hard Shot Peening process as claimed in (b) having the  
following process parameters:

shot size ranging from 0.5 to 0.8 mm,

shot hardness 610 to 800 Hv,

shot velocity 60 to 150 m/sec ,

10 part coverage 200 to 500% and

Almen A arc height 0.6 to 0.9 mm.